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ORIGINAL ARTICLE

Diagnostic Value of Pipelle, Curretage Biopsy and Hysteroscopic Biopsy in Cases of Postmenopausal Bleeding

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ABSTRACT

Background: The main objective of this study is to assess and compare the diagnostic accuracy of pipelle biopsy and D&C hysteroscopic guided biopsy with the usual pathology following surgical hysterectomy. **Methods**: This research was conducted as a prospective cross-sectional analysis and involved seventy two participants who were divided into 3 groups. Group A offered formal dilatation and curettage (n=24), Group B offered pipelle cytology (n=24), Group C offered hysteroscopic directed biopsy (n=24). **Results**: ROC-curve analysis was employed to assess the performance of the formal D&C biopsy approach in identifying patients with malignancy. The method demonstrated good accuracy, with a sensitivity of 63% and specificity of 100% ($p < 0.01$). The hysteroscopic guided biopsy approach accurately identified individuals with cancer, demonstrating exceptional accuracy, with a sensitivity of 91% and specificity of 100% ($p < 0.01$). The Pipelle approach accurately recognized individuals with cancer, exhibiting exceptional accuracy, with a sensitivity of 90% and specificity of 100% ($p < 0.01$). **Conclusion**: Pipelle endometrial sample and hysteroscopy are simple and secure techniques for obtaining tissue diagnosis.

Keywords: Pipelle, Curretage Biopsy, Hysteroscopic Biopsy, Postmenapusal bleeding.

INTRODUCTION

Postmenopausal bleeding is a common reason for approximately 5% of patients to be referred to a gynecologist's office. Postmenopausal women experiencing bleeding should undergo endometrial sampling to exclude the possibility of malignancy, as the occurrence of endometrial cancer in this group is approximately 10%. Evaluating abnormal uterine bleeding (AUB) in people over the age of 40 or those experiencing menopause is highly significant. Typically, benign lesions are managed using medical or conservative treatment. Therefore, it is possible to prevent the need for excessive and extreme surgical procedures [1].

Various techniques can be employed to evaluate the endometrium, including ultrasonography, endometrial curettage, hysteroscopy, and obtaining endometrial samples using a pipelle. Diagnostic dilatation and curettage (D&C) is a highly reliable method for obtaining an endometrial biopsy. However, it requires anesthesia and hospitalization and has the risk of complications such as infection or uterine

perforation. Nevertheless, in the majority of instances, less than 60% of the uterine cavity is subjected to curettage. Consequently, there has been a shift towards employing less intrusive methods in recent years [2].

The primary and fundamental diagnostic technique for endometrial pathology is the endometrial biopsy. In order to make an accurate diagnosis, it is essential to collect a specimen that is both abundant and of satisfactory quality. Outpatient equipment, such as Pipelle, Vabra Z-sampler, or Gynoscan, is the preferred approach. Nondiagnostic biopsies primarily result from unsuccessful attempts to access the uterine cavity and inadequate or insufficient tissue samples. The Pipelle technique, which is widely utilized, yields a diagnostic result in an average of 13% of cases. However, the percentage of nondiagnostic results is significantly higher after menopause. Dilatation and curettage (D&C) is a more intrusive procedure, but it does not adequately acquire a specimen from the uterine cavity [3].

Cervical cancer screening has evolved into an established strategy and is extensively employed in clinical settings. Unfortunately, there is currently no cost-effective screening procedure available for endometrial cancer. In conventional endometrial histology, the sample is mostly acquired through dilatation and curettage (D&C) or hysteroscopy, both of which are invasive and expensive procedures. Several different endometrial sample devices have been utilized to collect endometrial cells or tissue for screening purposes [4].

Given the limitation that no procedure permits the complete removal of tissue from the entire uterine cavity, it is crucial to tailor the proper technique to suit each individual woman. Several studies have conducted comparisons between Pipelle and D&C to assess the precision in detecting different types of endometrial diseases. Comparable levels of sensitivity and specificity were seen in the diagnosis of atypia and endometrial cancer. However, there is limited knowledge regarding the factors that influence the effectiveness of Pipelle and D&C procedures. Acquiring the suitable sample from the uterine cavity is crucial for the diagnosis. Identifying the factors that can affect the effectiveness of endometrial biopsy can assist in choosing the appropriate diagnostic instrument for each patient [5].

The pipelle device is a cost-effective method for doing endometrial biopsy, which can be carried out in an office environment, as opposed to curettage. According to the literature, the pipelle approach has been proposed as a highly accurate diagnostic method for assessing endometrial cancer [5].The Pipelle procedure is favored by patients because to its non-invasive nature, eliminating the need for hospitalization or anesthesia [6].

Although there are still issues over the adequacy of sampling and the diagnostic value, that may result in the omission of certain malignant lesions in the uterine cavity. Several researches have examined the effectiveness of pipelle and D&C, hysteroscopic guided biopsy. However, there is limited evidence available regarding the effectiveness of these two methods and the pathology reports from hysterectomy. The objective of this study is to assess and compare the diagnostic accuracy of pipelle biopsy and D&C hysteroscopic guided biopsy with the usual pathology following surgical hysterectomy.

METHODS

This research was conducted as a prospective cross-sectional analysis and involved seventy two participants who were divided into 3 groups: Group A offered formal dilatation and curettage (n=24), Group B offered pipelle cytology (n=24), Group C offered hysteroscopic directed biopsy (n=24). This study was carried out in Outpatient clinics of Obstetrics and Gynecology Department of Zagazig University Hospitals throughout the period from December 2022 to June 2023 after acquiring a local institutional review board (IRB number 10273/27-12-2022) approval and informed written consent from all patients' parents before the start of the research.The Declaration of Helsinki, issued by the World Medical Association to ensure the protection of individuals

participating in medical research, was strictly adhered to during this study**.**

Inclusion criteria Postmenopausal bleeding patients underwent transvaginal ultrasonography with endometrial thickness more than 5 mm, Vaginal color Doppler ultrasound indicating abnormal thickening of the endometrium, Patients attending follow-up examinations after oral progesterone treatment for endometrial hyperplasia, cases who were planned for hysterectomy, failure of medical or other surgical lines of treatment for Postmenopausal bleeding (other than hysterectomy). **The exclusion criteria** were applied to patients with cervical lesions, coagulopathy, thrombocytopenia, the use of anti-coagulants, bleeding caused by endocrinological disorders, liver and kidney diseases, systemic lupus erythematosus, cervical stenosis, and genital infections. Patients with endometrial hyperplasia treated with levonorgestrel intrauterine system (LNG-IUS), acute vaginitis or pelvic inflammatory disease, those not scheduled for hysterectomy, and those who responded to medical or other surgical treatments for postmenopausal bleeding were also excluded.All patients were subjected to a full medical history, complete clinical and gynecological examination, Investigations included transvaginal ultrasound assessment was done with endovaginal transducer of 5-7.5 MHz frequency on voluson 730 pro - machine (GE Healthcare, Austria).

Dilatation and curettage were performed with Hegar dilators. Subsequently, a curette,that is a metallic rod featuring a handle on one extremity and a sharp loop on the other, is introduced into the uterus via the dilated cervix. The curette is employed to delicately abrade the endometrial lining of the uterus and extract the tissue within the uterine cavity. The tissue is placed in a vial labeled 1 that contains a 10% formalin solution and is then sent for histological analysis.

The procedure of **Pipelle aspiration cytology** involves inserting a speculum to provide visibility, using a reliable light source to visualize the cervix, and gently passing the Pipelle through the cervical canal, holding it between the finger and thumb. Carefully insert the Pipelle until it reaches the upper part of the uterus, then remove the inner plunger. To extract tissue from all sides of the uterine wall, the Pipelle should be inserted into the cavity and dragged back and forth while being rotated. The vulsellum might be utilized to seize the front edge of the cervix and align the canal in case the Pipelle instrument encounters difficulty in passing through. Subsequently, the tissue was gathered and transferred into a container labeled 2, which contained a solution of 10% formalin. The sample was then dispatched for histological analysis.

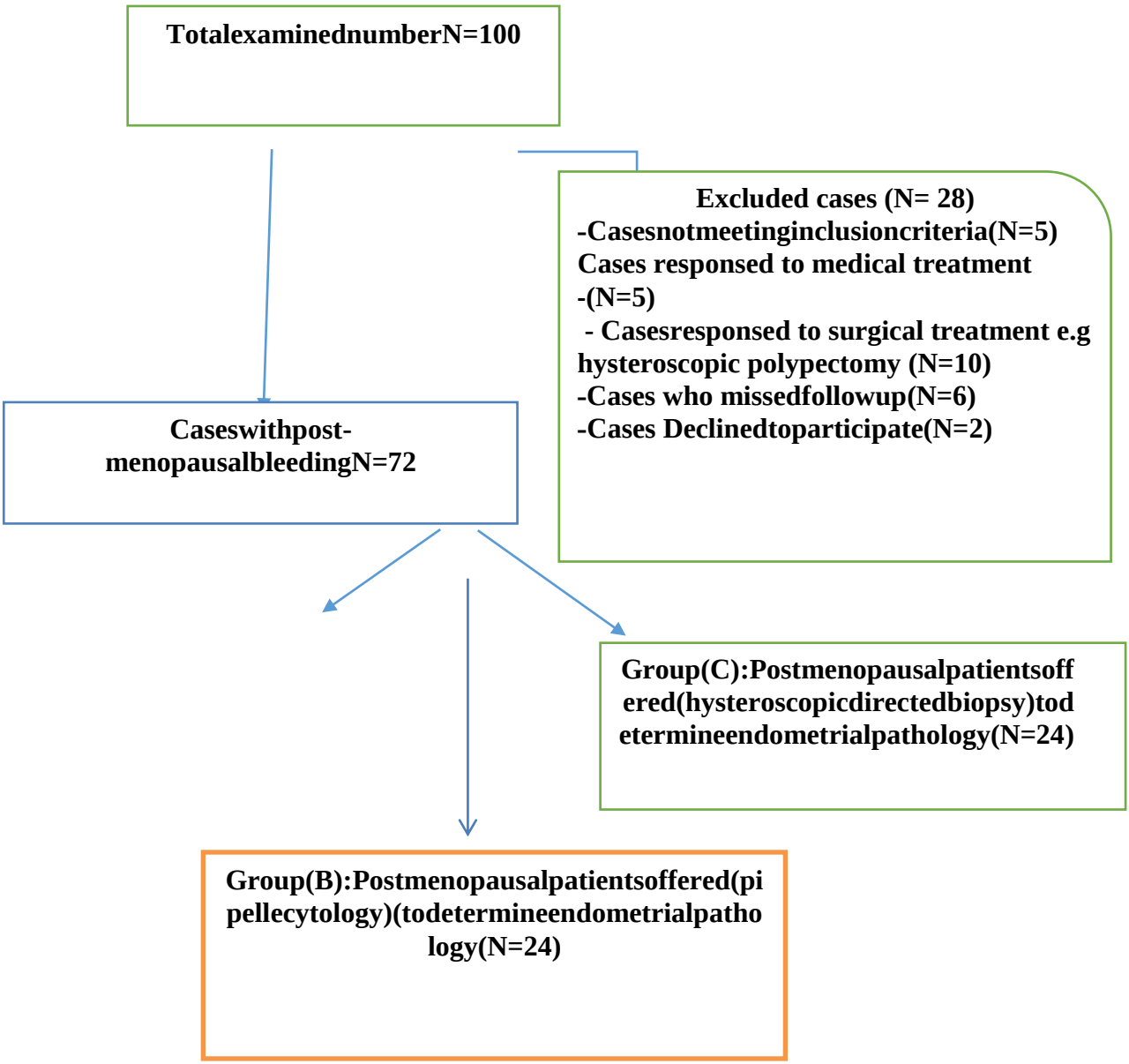
Office hysteroscopy involves the use of plastic bags filled with glycine or saline, which are attached to dual infusion tubes to maintain a continuous expansion of the uterus. Subsequently, each bag was enveloped in a pressure infusion cuff, akin to the one employed in measuring blood pressure, in order to achieve a pressure range of 50-80 mmHg. The tube was linked to the hysteroscope camera monitor. Upon entering the cavity, a comprehensive view of the uterine cavity was obtained to rule out any uterine deformities or abnormalities in its shape. The examination should commence in a methodical manner, beginning with the fundus, followed by the anterior, posterior, and lateral walls of the uterus, concluding with the visualization of the uterotubal junctions. Upon completion of the procedure, the hysteroscope was gradually removed from the cervical canal in order to identify any intracervical abnormalities and observe the functioning of the internal os. The biopsy was collected and placed in a vial labeled 3, which contained a 10% formalin solution. It was then sent for histological investigation.At the end, in this study the pathology of endometrial tissue obtained by D&C, pipelle and hysteroscopy was compared with the final histopathology after hysterectomy for those who underwent hysterectomy.

Statistical methods:

The statistical analysis was conducted using SPSS 20 computer software. Qualitative information is expressed numerically and as percentages (N. %), and information that is quantitative, after undergoing normality

testing using Shapiro-Wilk test, is represented with mean ± standard deviation (SD) and (range) if it was normally distributed. Inferential statistics: The P value, also known as the significance level, is utilized to ascertain the statistical significance of a given outcome. If the P value is greater than 0.05, the result is considered non-significant. On the other hand, if the P value is less than or equal to 0.05, the result is considered significant. In order to analyze quantitative data, either a t-test or a Mann-Whitney test was used to compare two independent samples. The ANOVA test or Kruskal-Wallis test were used to compare more than two independent variables.

Results



This cross-sectional study involvedinitially 100 Postmenopausal patients were recruited for the study but 28 cases were excluded (5 Cases not meeting inclusion criteria, 5 Cases responded to medical treatment,10 Cases responded to surgical treatment e.g. hysteroscopic polypectomy, 6 Cases who missed follow up 2 Cases declined to participate) finally, 72 patients were included and subdivided into 3 groups: Group (A): Postmenopausal patients offered (formal dilatation and curettage biopsy) to determine endometrial pathology (N =24)Group (B): Postmenopausal patients offered (pipelle

cytology) (to determine endometrial pathology (N =24)Group (C): Postmenopausal patients offered (hysteroscopic directed biopsy) to determine endometrial pathology (N =24). No significant data between studied groups as regard age Parity, and BMI or the co-morbidity.The pathological findings of Group (A) revealed normal in 4 cases (16.6%), endometrial hyperplasia in 4 cases (16.6%), hyperplasia with atypia in 3 patients (12.5%), polyp in 2 patients (8.3%), endometritis in 4 patients (16.6%). WhileGroup (B) revealed normal in 9 cases (37.5%) and the most common endometrial lesion was endometrial hyperplasia (20.8%) but it cannot detect any polyp (0%). Also, Group(C) revealed normal in 5 cases (20.8%) and the most common endometrial lesion was endometrial hyperplasia (25%).In terms of diagnostic accuracy metrics, hysteroscopic guided biopsy is superior to other methods for diagnosing various endometrial diseases.

ROC-curve analysis was employed to assess the performance of the formal D&C biopsy approach in identifying patients with malignancy. The method demonstrated good accuracy, with a sensitivity of 63% and specificity of 100% ($p < 0.01$). The hysteroscopic guided biopsy approach accurately identified individuals with cancer, demonstrating exceptional accuracy, with a sensitivity of 91% and specificity of 100% ($p < 0.01$). The Pipelle approach accurately recognized individuals with cancer, exhibiting exceptional accuracy, with a sensitivity of 90% and specificity of 100% ($p < 0.01$).

Logistic regression analysis indicates that the inclusion of certain predictor factors reveals that both age and menopausal age independently contribute to an increased likelihood of cancer detection. This finding is statistically significant, with a p-value of less than 0.05 for both variables.

Table (1): Demographic data of studied groups

	Group(A) N =24		**Group (B) N =24**		**Group (C) N =24**		**p-value**
Age(years) Mean± SD	49.0±2.83		50.0±2.23		51.0±2.93		0.876
BMI(k/m2) Mean± SD	30.46±5.1		31.46±2.1		29.46±6.1		0.321
Parity :	**Group(A) N =24**		**Group (B) N =24**		**Group (C) N =24**		**p-value**
	N	**%**	**N**	**%**	**N**	**%**	
Nullipara	15	62.5	16	66.6	14	58.3	0.421
Multipara	9	37.5	8	33.4	10	41.7	

Table (2): Pathology of endometrial tissue obtained by endometrial curettage, pipelle and hysteroscopy

	Group(A) N =24		Group (B) N =24		Group (C) N =24	
	N	%	N	%	N	%
Normal	4	16.6	9	37.5	5	20.8
Endometrial hyperplasia without atypia	4	16.6	5	20.8	6	25
Endometrial hyperplasia with atypia	3	12. 5	2	8.3	1	4.1
Atrophic	3	12. 5	1	4.1	3	12. 5
Malignant	4	16.6	3	12. 5	3	12. 5
Polyp	2	16.6	0	0	3	12.4
Endometritis	4	16.6	4	16.6	3	12. 5
Total	24	100	24	100	24	100

Table (3): Diagnostic accuracy parameters of formal dilatation and curettage biopsy, pipelle and hysterscopic directed biopsy for detection of endometrial lesions with respect to pathological diagnosis after hysterectomy**.**

Pathological diagnosis after hysterectomy	Sensitivity	Specificity	PPV	NPV	Accuracy
Hyperplasia					
formal dilatation and curettage biopsy	100.00%	65.00 %	22.22%	100.00 %	68.18%
hysteroscopic directed biopsy	100.00%	100.00 %	100.00%	100.00 %	100.00%
Pipelle	100.00%	85.00 %	40.00%	100.00 %	86.36%
Polyp					
formal dilatation and curettage biopsy	50.00%	95.00 %	50.00%	95.00 %	90.91%
hysteroscopic directed biopsy	100.00%	95.00 %	66.67%	100.00 %	95.45%
Pipelle	0.00%	100.00 %	….	90.91 %	90.91%
Malignancy					
formal dilatation and curettage biopsy	63.64%	100.00 %	100.00%	73.33 %	81.82%
hysteroscopic directed biopsy	90.91%	100.00 %	100.00%	91.67 %	95.45%
Pipelle	90.91%	100.00 %	100.00%	91.67 %	95.45%
Atrophic					
formal dilatation and curettage biopsy	100.00%	100.00 %	100.00%	100.00%	100.00%
hysteroscopic directed biopsy	100.00%	100.00 %	100.00%	100.00%	100.00%
Pipelle	60.00%	100.00 %	100.00%	89.47 %	90.91%

Table (4): Roc-curve of formal dilatation and curettage biopsy validity in detecting malignancy

Variable	AUC	SE	Sensitivity (%)	Specificity (%)	PPV	NPV	Accuracy	P value
formal D&C biopsy validity	0.818	0.0525	63.64	100	100	73.33	81.82	<0.0001**
hysterscopic directed biopsy validity	0.955	0.0314	91	100	100	91.67	95.45	<0.0001**
Pipelle validity	0.955	0.0314	90.9	100	100	91.67	95.45	<0.0001**

ROC (Receiver operating characteristic), AUC= Area under curve, SE= Standard Error.

Table (5) : Logistic regression modelforthe Factors affectingcancer detection**.**

Predictor Factor	Coefficient	Std. Error	P value
Age	0.22939	0.083772	0.0062**
Menopausal age	0.36589	0.14816	0.013**
Parity	-2.62493	0.26139	1.000
DM	0.74194	0.61625	0.2286
HTN	0.74194	0.61625	0.2286

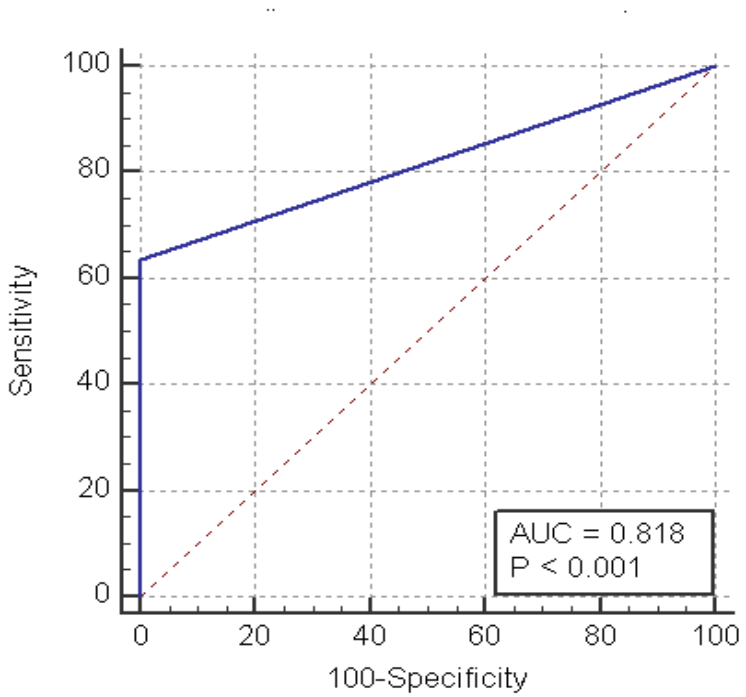


Figure (1): ROC curve of formal D&C biopsy validity.

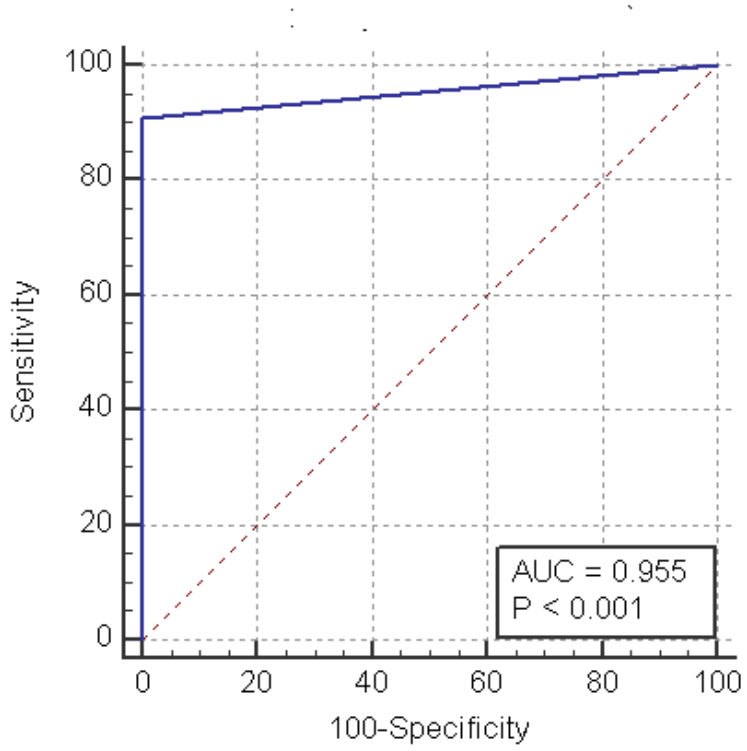


Figure (2): ROC curve of of hysterscopic directed biopsy validity

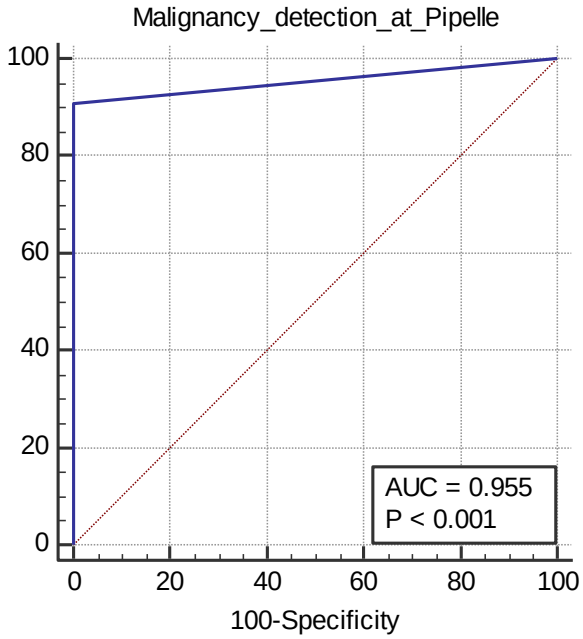


Figure (3):ROC curve of Pipelle validity

DISCUSSION

Postmenopausal bleeding is a common reason for roughly 5% of patients to be sent to gynecologists' offices. Postmenopausal women experiencing bleeding should undergo endometrial sampling to exclude the possibility of malignancy, as the occurrence of endometrial cancer in this group is approximately 10%.

Endometrial hyperplasia was the prevailing endometrial lesion in the present investigation. This finding aligns with the study conducted by Chandrakumari et al., [7], where they examined endometrial samples from 210 individuals with abnormal uterine bleeding (AUB). The samples were initially taken using the pipelle method and then followed by dilation and curettage (D&C). The histopathological analysis of endometrial samples obtained using the pipelle method showed the presence of endometrial cancer in seven cases (3%), atypical endometrial hyperplasia in seven cases (3%), and endometrial hyperplasia in 85 cases (40.5%). Dilation and curettage (D&C) identified endometrial cancer in 9 cases (4.3%), atypical endometrial hyperplasia in 6 instances (2.9%), atrophic endometrium in 10 cases (4.8%), endometrial hyperplasia in 77 cases (36.7%), and atypical endometrial hyperplasia in 6 cases (2.9%). Therefore, endometrial hyperplasia is the most frequent reason for postmenopausal bleeding.

The findings were consistent with Alshdaifat et al., [8], who discovered that out of 140 samples obtained through conventional D&C, 49 specimens showed endometrial hyperplasia, 8 specimens showed endometritis, 3 specimens showed endometrial polyps, and 10 specimens showed malignant endometrium upon histopathological examination.Pipelle identified endometrial hyperplasia in 49 specimens, endometritis in 7 specimens, endometrial polyps in 1 specimen, and malignant endometrium in 10 specimens. Therefore, the most common cause is endometrial hyperplasia. Liu et al. (2015) discovered that endometrial hyperplasia was the most frequent cause of postmenopausal hemorrhage.

This study contradicts the findings of Demirkiran et al., [9], who conducted a study on a sample size of 478 patients. The histopathological examination using the pipelle method revealed that out of 478 cases, 356 (74.5%) had a normal endometrium, 22 (4.6%) had hyperplasia, 18 (3.8%) had hyperplasia with atypia, 59 (12.3%) had focal lesions, 7 (1.5%) had atrophy, and 16 (3.3%) were insufficient for diagnosis. On the other hand, the D & C biopsy results showed that out of 478 cases, 330 (69%) had a normal endometrium, 21 (4.4%) had hyperplasia, 20 (4.2%) had hyperplasia with atypia, 89 (18.6%) had focal lesions, 9 (1.9%) had atrophy, and 9 (1.9%) were insufficient for diagnosis. Therefore, the most common cause of postmenopausal bleeding was found to be focal lesions, specifically endometrial polyps.

This finding contradicts the information presented in the literature on the predominant cause of PMB. In the study conducted by Rezaei et al. [10], they examined 48 cases of PMB. The prevalent pathology finding (39.6%) was endometrial atrophy. Additional discoveries included hyperplasia (20.8%), hormonal imbalance (14.6%), polyps (12.5%), and endometrial cancer (2.1%). Endometrial atrophy was more prevalent among patients aged 48 to 59 years. Among those aged 48 to 59 years, the prevalence of cancer was 3.1%, while endometrial atrophy was observed in 40.6% of the population. Out

of the patients who were 6-10 years post their menopause, 6.7% were diagnosed with cancer and 40% had endometrial atrophy.

In addition, Mishra et al. [11] conducted a study on 42 cases of postmenopausal bleeding (PMB). All patients with endometrial pathology received endometrial biopsy after hysteroscopy, and the collected endometrial tissue was sent for histopathological evaluation. The histopathological analysis revealed that the majority of patients, specifically 19 (45.2%), exhibited endometrial atrophy. Endometrial hyperplasia was identified in 8 instances, accounting for 19% of the total. A polyp was detected in 11 cases, representing 26.2% of the total. Endometritis was observed in 2 cases, amounting to 4.8% of the total. Additionally, endometrial cancer was the histological diagnosis in 2 cases.

The discrepancy between our study and the literature about the primary cause of postmenopausal bleeding may be attributed to the fact that our study was conducted in the gynecological oncology department at Zagazig University Hospitals.

In cases of hyperplasia our data reported a total agreement between D&C, and histopathology in the diagnosis of endometrial hyperplasia were (100% sensitivity specificity of 65.0%), being more accurate than pipelle while hysteroscopy was superior for both (100% sensitivity specificity of 100%). In polypoidal lesions the diagnostic accuracy of D&C was more accurate than pipelle (sensitivity 50% and 0%, respectively) with respect to histopathology. Hysteroscopy was superior for both (100% sensitivity and accuracy 95%). In cases of endometrial atrophy the diagnostic accuracy of D&C and hysteroscopy was identical (sensitivity of 100%%, PPV of 100% and accuracy of 100% for both), but pipelle sensitivity was 60%.

While in cases of malignancy hysteroscopy is more superior to D&C (sensitivity 90.91 % and 63.64%, accuracy 95.45% and 81.82% respectively) with respect to histopathology. While pipelle sensitivity was 50.91% and accuracy 75.45%

Regarding validity of hysteroscopy in detection of malignancy different endometrial lesions, compared to pathological diagnosis after hysterectomy our study revealed: In detection of Atrophic endometritis, hysteroscopy has (100.00 %,for all sensitivity specificity, PPV,NPV and accuracy) compared to pathological diagnosis after hysterectomy. In detection of endometrium malignancy, hysteroscopy has (90.91%,100.00 %,100.00%, 91.67 % and 95.45% sensitivity specificity, PPV,NPV and accuracy respectively), In detection of Hyperplasia, hysteroscopy has (100.00%,for all sensitivity specificity, PPV,NPV and accuracy respectively) In detection of Polyp, hysteroscopy has (100.00%,95.00 %, 66.67%,100.00 % and 95.45% sensitivity specificity, PPV,NPV and accuracy respectively)

Our study closely aligned with the research conducted by Bingol et al. [12] on 137 postmenopausal women with abnormal uterine bleeding. These women were admitted to the Department of Obstetrics and Gynecology at Istanbul Bilim University. All patients underwent hysteroscopy, and the results showed that hysteroscopy had a sensitivity of 94.8%, specificity of 98.9%, positive predictive value (PPV) of 97.3%, and negative predictive value (NPV) of 97.9% for detecting endometrial hyperplasia. Hysteroscopy had a sensitivity of 98.0%, specificity of 96.5%, and positive predictive

value (PPV) of 94.4% for polypoid lesions.

Our findings align with the conclusions made by Grimbizis et al. [13] in their study, which aimed to assess the effectiveness of diagnostic hysteroscopy (DH) in identifying endometrial lesions in symptomatic women. The study found that hysteroscopy was significantly more accurate than pipelle and D & C in diagnosing intracavitary masses, specifically endometrial polyps.

Our study aligns with the findings of El-Gamal et al [14], who showed that hysteroscopy had a sensitivity of 91.9%, specificity of 86.5%, positive predictive value of 93.2%, negative predictive value of 84.2%, and diagnostic accuracy of 90.1% for determining the cause of irregular uterine bleeding.

Furthermore, the findings are corroborated by Valson et al., [15], who demonstrated that Hysteroscopy accurately detected polyps, hyperplasia, and submucosal myoma with a 100% success rate. The diagnosis was confirmed through the examination of post hysterectomy specimens sent for histology, resulting in a sensitivity, specificity, PPV, and NPV of 100%.

Contrary to Garg et al., [16] findings, which indicated that hysteroscopy has a low level of accuracy, sensitivity, and specificity (71%, 54.55%, and 97.96% respectively) in diagnosing endometrial hyperplasia, which was the lowest among all diseases.

Regarding D&C validity in detection of different endometrial lesions compared to pathological diagnosis after hysterectomy our study revealed : In detection of Atrophic endometritis, D&C has (100.00 %,for all sensitivity specificity, PPV,NPV and accuracy) compared to pathological diagnosis after hysterectomy. In detection of endometrium malignancy, D&C has (90.91%,100.00 %, 100.00%, 73.33 % and 81.82% sensitivity specificity, PPV,NPV and accuracy respectively), In detection of Hyperplasia, D&C has (100.00%,65.00 %,22.22%,100.00 % and 68.18% sensitivity specificity, PPV,NPV and accuracy respectively) In detection of Polyp, D&C has (50.00%, 95.00 % 50.00%, 95.00 % and 90.91% sensitivity specificity, PPV,NPV and accuracy respectively)

The results of our study align with the findings of Phalak et al., [17], which reported that 44% of cases had abnormal histopathological findings on D&C. Specifically, 45.46% of cases had hyperplasia, 27.27% had polyps, and 9.09% had submucosal fibroids.

This study corroborated the findings of Singh et al., [18], who conducted a study on 100 women with abnormal uterine hemorrhage. In their investigation, hysteroscopy was performed coupled with curettage to obtain tissue samples for histological evaluation. Histopathology results of the tissue samples submitted for biopsy revealed normal findings in 59% of the patients. Hyperplasia was observed in 20% of cases, while an additional 5% exhibited a hormonal pattern. This occurred as a result of administering hormone treatment to patients with abnormal uterine hemorrhage.

This study presents a different perspective from Garg et al., [16]. Garg et al. conducted a study with 60 patients who visited the outpatient department due to abnormal uterine bleeding (AUB). These patients underwent a procedure called dilation and curettage (D & C) biopsy. The study found that endometrial polyps were the most common cause of AUB, accounting for 26.67% (n = 16) of the total cases. In 18.33% of the cases (n = 11), the endometrium appeared normal. Endometrial

hyperplasia was observed in 11.66% (n = 7) of the cases, while endometritis was present in 5% of the cases. There was one instance of endometrial atrophy and one instance of endometrial cancer.

Regarding validity of pipelle in detection of different endometrial lesions our study revealed : In detection of Atrophic endometritis, pipelle has (60.00%,100.00 %,100.00%,89.47 %,90.91% sensitivity and specificity, PPV,NPV and accuracy respectively) compared to pathological diagnosis after hysterectomy. In detection of endometrium malignancy, pipelle has (50.91%, 100.00 %, 100.00%, 51.67 % and 75.45% sensitivity specificity, PPV,NPV and accuracy respectively), In detection of Hyperplasia, pipelle has (100.00%, 85.00 %,40.00% 100.00 % and 86.36% sensitivity specificity, PPV,NPV and accuracy respectively) In detection of Polyp, pipelle has (0.00% 100.00 %,0 %,90.91 %, and 90.91% sensitivity specificity, PPV,NPV and accuracy respectively). Furthermore we found that its ability in detection of endometrial polyps and submucous fibroids is limited, leading to under-diagnosis of these diseases in postmenopausal women.

The findings of Saadia et al., [19] confirm these results. Their study compared hysteroscopy with the Pipelle method and found that the sensitivity of hysteroscopy was 94.4% and the sensitivity of Pipelle was 97.5% for detecting endometrial lesions.This finding aligns with the prior research conducted by Sanam and Majid, [20], where they examined a sample of 130 individuals aged 35 years and above who experienced irregular uterine hemorrhage. An endometrial sample was obtained from all patients using a Pipelle, without the need of anesthetic or dilatation. Subsequently, the patient underwent diagnostic curettage with a sharp curette while under general anesthesia. The duration of the sampling process was computed, and both samples were subsequently dispatched to the identical pathologist. A comparison was made between the diagnostic efficacy of two approaches in identifying normal endometrium, endometrial hyperplasia, and cancer. Two approaches were determined to have a sample adequacy of 88% and pathological outcomes of 94%. The detection rates for proliferative endometrial, secretory endometrium, simple hyperplasia without atypia, and malignancy were 100%, 90%, and 100% respectively. The diagnostic accuracy of Pipelle, when compared to curettage, has been shown to be over 97%. Therefore, the failure rate in this trial was less than 5%. The stated sensitivity of Pipelle for detecting atrophic endometrium was less than 50%.

The findings of Ali et al. [19] complement these results. Their study compared hysteroscopy with the Pipelle method and found that the sensitivity of hysteroscopy was 94.4% for detecting endometrial lesions, whereas the Pipelle method had a sensitivity of 97.5%.However, our current investigation contradicts the findings of Abd-Elmageed et al. [21], who found a sensitivity rate of 67% with pipelle biopsy in detecting endometrial hyperplasia, which is lower than the sensitivity rate shown in our study. The inclusion of several age groups as criterion in this study, as well as in others, is the reason for the observed variances. Another potential factor is the disparity in the instruments utilized specifically the curette and pipelle, which vary throughout several investigations.

CONCLUSION

Pipelle endometrial sample and hysteroscopy are simple and secure techniques for

obtaining tissue diagnosis. These procedures can be performed on an outpatient basis, with the added benefit of not requiring anesthesia. These methods are equally effective as D&C in assessing patients with postmenopausal bleeding. They have a high level of sensitivity and specificity in detecting endometrial hyperplasia and endometrial malignancy. However, the ability of Pipelle to detect endometrial polyps and submucous fibroids is limited.

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